Complete Summary

GUIDELINE TITLE

Management of obesity in children and young people. A national clinical guideline.

BIBLIOGRAPHIC SOURCE(S)

Scottish Intercollegiate Guidelines Network (SIGN). Management of obesity in children and young people. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2003 Apr. 24 p. (SIGN publication; no. 69). [117 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline was issued in 2003 and will be considered for review as new evidence becomes available.

Any amendments to the guideline will be noted on the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Obesity

GUIDELINE CATEGORY

Diagnosis
Management
Prevention
Treatment

CLINICAL SPECIALTY

Family Practice
Nursing
Nutrition
Pediatrics

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Dietitians
Nurses
Physician Assistants
Physicians
Psychologists/Non-physician Behavioral Health Clinicians

GUIDELINE OBJECTIVE(S)

- To provide recommendations based on current evidence for best practice in the management of obesity in children and young people, up to the age of 18
- To review the definition of childhood obesity and information on prevalence of childhood obesity in the United Kingdom and recent trends in the prevalence of obesity
- To identify the immediate consequences of obesity in childhood and possible consequences in adulthood
- To identify subgroups of children at high risk for developing obesity
- To review preventive interventions for childhood obesity
- To discuss the treatment of childhood obesity and the goals of therapy, particularly management in the community and management beyond primary care, including advice on healthy eating
- To make recommendations for research for systematic evaluation of childhood obesity

Note: Appraising the role of screening for obesity in children was not within the remit of this guideline.

TARGET POPULATION

Children and young people up to the age of 18 who are suspected of having obesity

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

Body mass index (BMI) percentile

Treatment/Management

1. Healthier eating (refer to Annex 2 of the original guideline document)

2. Increased habitual physical activity (e.g., brisk walking) to a minimum of 30 minutes/day
3. Reduction in physical inactivity (e.g., watching television and playing computer games) to <2 hours/day or 14 hours/week
4. Weight maintenance
5. Referral to hospital or community paediatric consultants
6. Modest weight loss of no more than 0.5 kg/month*

*For obese children over 7 years who can demonstrate prolonged weight maintenance and who are cared for by secondary services

MAJOR OUTCOMES CONSIDERED

- Body mass index (BMI) comparisons with population reference data (BMI percentiles/distributions)
- Short- and long-term morbidity

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The evidence base for this guideline was synthesised in accordance with the Scottish Intercollegiate Guidelines Network (SIGN) methodology. A systematic review of the literature was carried out using an explicit search strategy devised by the SIGN Information Officer in collaboration with members of the guideline development group. The search for systematic reviews and meta-analysis covered the Cochrane Library, MEDLINE, EMBASE, CINAHL and HEALTHSTAR databases, and the internet, from January 1991 to December 2001. The search for randomised controlled trials, cohort studies, case control studies, and cross-sectional surveys covered the Cochrane Library, MEDLINE, PUBMED, EMBASE and CINAHL databases, and the internet, from January 1981 to December 2001. The evidence base was updated during the course of development of the guideline, and the search was supplemented by reviewing references identified from papers from the searches, from personal databases, and from hand searching of the obesity journals.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence

1++ - High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias

1+ - Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias

1- - Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias

2++ - High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+ - Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2- - Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3 - Non-analytic studies, e.g. case reports, case series

4 - Expert opinion

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

The Scottish Intercollegiate Guidelines Network (SIGN) carries out comprehensive systematic reviews of the literature using customized search strategies applied to a number of electronic databases and the Internet. This is often an iterative process whereby the guideline development group will carry out a search for existing guidelines and systematic reviews in the first instance and, after the results of this search have been evaluated, the questions driving the search may be redefined and focused before proceeding to identify lower levels of evidence.

Once papers have been selected as potential sources of evidence, the methodology used in each study is assessed to ensure its validity. SIGN has developed checklists to aid guideline developers to critically evaluate the methodology of different types of study design. The result of this assessment will affect the level of evidence allocated to the paper, which in turn will influence the grade of recommendation it supports.

Additional details can be found in the companion document titled "SIGN 50: A Guideline Developers' Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50]), available from the SIGN Web site.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The process for synthesizing the evidence base to form graded guideline recommendations is illustrated in the companion document titled "SIGN 50: A Guideline Developers' Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50], available from the SIGN Web site.

Evidence tables should be compiled, summarizing all the validated studies identified from the systematic literature review relating to each key question. These evidence tables form an important part of the guideline development record and ensure that the basis of the guideline development group's recommendations is transparent.

In order to address how the guideline developer was able to arrive at their recommendations given the evidence they had to base them on, SIGN has introduced the concept of considered judgement.

Under the heading of considered judgement, guideline development groups are expected to summarise their view of the total body of evidence covered by each evidence table. This summary view is expected to cover the following aspects:

- Quantity, quality, and consistency of evidence
- Generalisability of study findings
- Applicability to the target population of the guideline
- Clinical impact (i.e., the extent of the impact on the target patient population, and the resources need to treat them.)

Guideline development groups are provided with a pro forma in which to record the main points from their considered judgement. Once they have considered these issues, the group are asked to summarise their view of the evidence and assign a level of evidence to it, before going on to derive a graded recommendation.

The assignment of a level of evidence should involve all those on a particular guideline development group or subgroup involved with reviewing the evidence in relation to each specific question. The allocation of the associated grade of recommendation should involve participation of all members of the guideline development group. Where the guideline development group is unable to agree a unanimous recommendation, the difference of opinion should be formally recorded and the reason for dissent noted.

The recommendation grading system is intended to place greater weight on the quality of the evidence supporting each recommendation, and to emphasise that the body of evidence should be considered as a whole, and not rely on a single study to support each recommendation. It is also intended to allow more weight to be given to recommendations supported by good quality observational studies

where randomised controlled trials (RCTs) are not available for practical or ethical reasons. Through the considered judgement process guideline developers are also able to downgrade a recommendation where they think the evidence is not generalisable, not directly applicable to the target population, or for other reasons is perceived as being weaker than a simple evaluation of the methodology would suggest.

On occasion, there is an important practical point that the guideline developer may wish to emphasise but for which there is not, nor is their likely to be, any research evidence. This will typically be where some aspect of treatment is regarded as such sound clinical practice that nobody is likely to question it. These are marked in the guideline as "good practice points." It must be emphasized that these are not an alternative to evidence-based recommendations, and should only be used where there is no alternative means of highlighting the issue.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

The grade of recommendation relates to the strength of the evidence on which the recommendation is based. It does not reflect the clinical importance of the recommendation.

Grade A: At least one meta-analysis, systematic review of randomized controlled trials (RCTs), or randomized controlled trial rated as 1++ and directly applicable to the target population; or

A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

Grade B: A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or

Extrapolated evidence from studies rated as 1++ or 1+

Grade C: A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or

Extrapolated evidence from studies rate as 2++

Grade D: Evidence level 3 or 4; or

Extrapolated evidence from studies rated as 2+

Good Practice Points: Recommended best practice based on the clinical experience of the guideline development group.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

A national open meeting is the main consultative phase of the Scottish Intercollegiate Guidelines Network (SIGN) guideline development, at which the guideline development group presents their draft recommendations for the first time. The national open meeting for this guideline was held in September 2001 and was attended by 218 representatives of all the key specialties relevant to the guideline, including mothers of children with obesity. The draft guideline was also available on the SIGN web site for a limited period at this stage to allow those unable to attend the meeting to contribute to the development of the guideline.

The guideline was reviewed in draft form by a panel of independent expert referees, who were asked to comment primarily on the comprehensiveness and accuracy of interpretation of the evidence base supporting the recommendations in the guideline.

The guideline was then reviewed by an Editorial Group comprising relevant specialty representatives on SIGN Council, to ensure that the peer reviewers' comments had been addressed adequately and that any risk of bias in the guideline development process as a whole had been minimised.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Note from the Scottish Intercollegiate Guidelines Network (SIGN) and National Guideline Clearinghouse (NGC): In addition to these evidence-based recommendations, the guideline development group also identifies points of best clinical practice in the full-text guideline document.

The grades of recommendations (A-D) and levels of evidence (1++, 1+, 1-, 2++, 2+, 2-, 3, 4) are defined at the end of the "Major Recommendations" field.

Definitions and Prevalence of Obesity

Definition of childhood obesity

D - Obesity should be identified by objective (anthropometric) means.

C - The body mass index (BMI) percentile should be used to identify childhood obesity.

D - For clinical use, obese children are those with a BMI $\geq$98th centile of the United Kingdom (UK) 1990 reference chart for age and sex.

D - For epidemiological (research) purposes:

- Overweight should be defined as BMI ≥85th centile of the 1990 reference data
- Obesity should be defined as BMI ≥95th centile of the 1990 reference data for age and sex

Consequences of Childhood Obesity

Do obese children become obese adults?

C - Prevention and treatment of obesity should be initiated in childhood.

C - Parental obesity should be recognised as a risk factor for childhood obesity to persist into adulthood.

Prevention

Preventive interventions for childhood obesity

C - School, family and societal interventions should be considered for the prevention of obesity in children.

Treatment/Management

Treatment in the community

D - Treatment should only be considered where:

- A child is defined obese (BMI ≥98th centile) and
- The child and family are perceived to be ready and willing to make the necessary lifestyle changes

D - In most obese children (BMI ≥98th centile) weight maintenance is an acceptable goal.

D - Weight maintenance and/or weight loss can only be achieved by sustained behavioural changes, e.g.:

- Healthier eating (Refer to Annex 2 of the original guideline document)
- Increasing habitual physical activity (e.g., brisk walking) to a minimum of 30 minutes per day. In healthy children, 60 minutes of moderate-vigorous physical activity/day has been recommended
- Reducing physical inactivity (e.g., watching television and playing computer games) to <2 hours/day on average or the equivalent of 14 hours/week

D - In overweight children (BMI ≥91st centile) weight maintenance is an acceptable goal. Annual monitoring of BMI percentile may be appropriate to help reinforce weight maintenance and reduce the risk of children becoming obese.

D - The following groups should be referred to hospital or community paediatric consultants before treatment is considered:

- Children who may have serious obesity-related morbidity that requires weight loss (e.g., benign intracranial hypertension, sleep apnoea; obesity hypoventilation syndrome, orthopaedic problems and psychological morbidity)
- Children with a suspected underlying medical (e.g., endocrine) cause of obesity including all children under 24 months of age who are severely obese (BMI $\geq$99.6th centile)
- All children with BMI $\geq$99.6th centile (who are at higher risk of obesity-related morbidity)

D - For obese children over the age of seven years, who can demonstrate prolonged weight maintenance and who are cared for by secondary care services, modest weight loss (no more than 0.5 kg/month) is an acceptable goal.

Definitions

Grades of Recommendations

A - At least one meta-analysis, systematic review of randomised controlled trials (RCTs), or randomised controlled trial rated as 1++ and directly applicable to the target population; or

A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

B - A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or

Extrapolated evidence from studies rated as 1++ or 1+

C - A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or

Extrapolated evidence from studies rate as 2++

D - Evidence level 3 or 4; or

Extrapolated evidence from studies rated as 2+

Levels of Evidence

1++ - High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias

1+ - Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias

1- - Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias

2++ - High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal

2+ - Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal

2- - Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal

3 - Non-analytic studies, e.g. case reports, case series

4 - Expert opinion

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Diagnosis of obesity in childhood is less robustly performed than for adults, and this has led to a wide variation in practice. Some large children have been labeled as obese and had needless referral and treatment, whereas some very obese children have not been recognised as being at risk nor had appropriate referral. The adverse consequences of childhood obesity, such as development of hypertension, hyperlipidaemia and type 2 diabetes, are under-recognised, as is the tendency for childhood obesity to persist into adult obesity. This guideline aims to provide recommendations for best practice in the prevention, diagnosis, management and treatment of obesity in children and young people, up to the age of 18.

Prevention

- Preventing obesity has many advantages given the limited evidence on the efficacy of treatment, the limited resources available for treatments, and the strong evidence of the adverse effects of child and adolescent obesity.
- One study with high methodological quality, the "Planet Health" trial, was a complex intervention which focused largely on changing the school environment over two school years. The multiple interventions used in these studies included decreased television viewing, increased physical activity, decreased fat intake, increased fruit and vegetable intake, altered class

curricula, and teaching of families, and would have major resource implications for public health if replicated in full. In Planet Health there was a significant reduction in obesity risk for girls (Absolute risk reduction 0.47, 95% Confidence Intervals 0.24-0.93) and a significant remission of existing obesity among girls (Absolute risk reduction 2.16, 95% Confidence Intervals 0.7-4.35). The trend in boys was in the same direction, but did not reach significance. The authors reported evidence that the effect observed was largely attributable to observed reductions in television viewing. In the only British study, the only positive outcome was a modest increase in the consumption of vegetables.

Diagnosis

The effectiveness of body mass index (BMI) as a screening tool to identify the fattest children correctly has been assessed by comparisons against measures of body fatness, such as hydrodensitometry and dilution of the stable isotopes deuterium and oxygen-18. Use of cut off ranges for body mass index is associated with high specificity and moderate sensitivity for identifying the fattest children, particularly when the cut off is greater than the 90th centile. These cut-offs are also clinically meaningful: obesity defined in this way is associated with short- and long-term morbidity (e.g., tendency for obesity to persist, presence and clustering of cardiovascular risk factors.)

Treatment/Management

- Parents and health professionals may be concerned that treating childhood obesity increases the risk of developing eating disorders, but the evidence for such an association is equivocal.
- When considering the prevention and treatment of childhood obesity, dietary energy restriction, increases in activity and decreases in sedentary behaviour must not compromise normal growth and development. In children, growth is only possible if energy intake (as food and drink) exceeds energy output (resting metabolic rate and activity). For these reasons, weight maintenance is often a suitable goal, rather than weight loss.

Subgroups Most Likely to Benefit

- Older age and socioeconomic deprivation: In the United Kingdom, the prevalence of obesity increases with age through childhood and adolescence, and there is no evidence of any marked difference in prevalence between boys and girls. Limited survey data suggest that the prevalence of obesity rises with increasing socioeconomic deprivation. No study has appropriately examined specific environmental factors, such as low habitual physical activity and inappropriately high habitual energy intake, which are believed to have causal roles in the current epidemic of childhood obesity.
- Obesity in one or both parent(s): There does appear to be a tendency for childhood obesity to persist into adult obesity, although no evidence was identified to demonstrate a direct link between the two. This tendency is strengthened when one parent is obese and further strengthened when both parents are obese. Cohort data also support the existence of such a link. The likelihood of persistence of obesity to adulthood increases with age of the child and with severity of the obesity.

POTENTIAL HARMS

The majority of published epidemiological work has used a definition of obesity as body mass index (BMI) ≥95th centile of the 1990 reference chart for age and sex and for comparative epidemiological purposes it is important to retain this definition. This definition has high specificity (it diagnoses few lean children as obese) but moderate sensitivity (that is, will fail to diagnose many of the fattest children as obese). As a diagnostic tool high specificity has been regarded as paramount since it reduces the likelihood that treatment will be offered to children who are not actually obese. The United Kingdom (UK) 1990 reference charts for BMI centiles for boys and girls give the 91 and 98 centile lines. For routine clinical use, the 98th centile is the recommended cut-off value defining obesity (refer to Annex 1 of the original guideline document). This is a pragmatic choice based on charts that are well accepted and widely available, and in this context means the UK 1990 reference charts for BMI centiles for children. These clinical definitions conflict with the majority of international literature, which has used a definition of BMI ≥ 85th centile of reference data for overweight and BMI ≥95th centile of reference data for obesity. It is important to maintain epidemiological definitions which are consistent with current literature. In future this may include the international cut-off values.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Patient Resources
Quick Reference Guides/Physician Guides

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Scottish Intercollegiate Guidelines Network (SIGN). Management of obesity in children and young people. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2003 Apr. 24 p. (SIGN publication; no. 69). [117 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2003 Apr

GUIDELINE DEVELOPER(S)

Scottish Intercollegiate Guidelines Network - National Government Agency [Non-U.S.]

SOURCE(S) OF FUNDING

Scottish Executive Health Department

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Guideline Development Group: Dr David Wilson (Chairman); Dr David Alexander; Ms Francesca Chappell; Dr Ann Dunbar; Dr Belinda Hacking; Dr Cathy Higginson; Ms Christine Hinch; Dr Chris Kelnar; Dr Zoe McDowell; Mrs Emily Methven; Dr Safia Qureshi; Dr Beth Rimmer; Dr John Reilly; Mrs Laura Stewart; Dr Carolyn Summerbell; Mrs Michelle Wilson; Mr Mehran Zabihollah

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

All members of the Scottish Intercollegiate Guidelines Network (SIGN) guideline development groups are required to complete a declaration of interests, both personal and non-personal. A personal interest involves payment to the individual concerned, e.g., consultancies or other fee-paid work commissioned by or shareholdings in the pharmaceutical industry; a non-personal interest involves payment which benefits any group, unit or department for which the individual is responsible, e.g., endowed fellowships or other pharmaceutical industry support. SIGN guideline group members should be able to act as independently of external commercial influences as possible, therefore, individuals who declare considerable personal interests may be asked to withdraw from the group. Details of the declarations of interest of any guideline development group member(s) are available from the SIGN executive.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline was issued in 2003 and will be considered for review as new evidence becomes available.

Any amendments to the guideline will be noted on the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Quick reference guide: Management of obesity in children and young people. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2003 Apr. 2 p. Available in Portable Document Format (PDF) from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.
- SIGN 50: a guideline developers' handbook. Edinburgh (UK): Scottish Intercollegiate Guidelines Network. (SIGN publication; no. 50). Available from the SIGN Web site.
- Appraising the quality of clinical guidelines. The SIGN guide to the AGREE (Appraisal of Guidelines Research and Evaluation) guideline appraisal instrument. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network, 2001. Available from the SIGN Web site.
- A background paper on the legal implications of guidelines. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network.

PATIENT RESOURCES

The following is available:

- Key messages for patients and parents. In: Management of obesity in children and young people. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2003 Apr. 24 p. (SIGN publication; no. 69).

Electronic copies: Available in Portable Document Format (PDF) from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

NGC STATUS

This summary was completed by ECRI on November 20, 2003. The information was verified by the guideline developer on January 16, 2004.

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